compounds of carbon. It was for this reason that they called the chemistry of these compounds organic chemistry, and it was very natural that that branch of their science should be nearer to their hearts than any other branch. But there was another and stronger reason for having special laboratories of organic chemistry. The methods of investigation and the way of analysing organic compounds differed considerably from those applied to inorganic chemistry. In the latter, if we had ascertained by an accurate analysis of a pure substance its percentage composition, that, together with the determination of a few simple physical properties, was usually sufficient to give us a perfect insight into its chemical composition and behaviour. The laboratory methods required for that study were simple and most of them well known, so that they could be acquired by sufficient experience. In organic compounds the matter was very different. The percentage composition and the physical properties told them very little of their chemical individuality and behaviour. Many substances of exactly the same percentage composition possessed widely different qualities, which were not explained by their physical properties. They must find out how these compounds, many of which were very complex, were built up. They had to unravel the structure of those substances to attain their end, which in chemical investigation always meant to give an explanation of all the various properties of a substance through its chemical constitution. To ascertain its structure they had to break the organic substance down by degrees, to take it gradually to pieces; and even that was not enough, but to make sure of the actual arrangement of those pieces in the substance they had to put them together again, to rebuild the substance from its proximate constituents, and only after having accomplished that could they consider that they knew its constitution. The methods employed in that work were entirely different from those of ordinary analysis. They were very manifold. The investigator had to make his own choice which of them to apply in any individual case, and wherever he broke new ground and undertook the study of a new series of compounds, he had to discover and work out new methods before he could achieve success. It was evident that a student who aimed at qualifying himself for such high-class work should enjoy special facilities, and should, after having gone through a regular course of analytical chemistry, have a chance of prosecuting special organic work in a laboratory fitted specially for it, and where he was undisturbed by the army of beginners who thronged an analytical laboratory. And there he might point out that in his opinion the reason why this country had not advanced in organic chemistry as fast as other countries, the reason why Hofmann's prediction in his report on the Exhibition of 1862 that "England will be unquestionably at no distant date the greatest colour-producing country in the world," had not been fulfilled, and that Germany had almost entirely taken this industry out of her hands, although it was inaugurated by an Englishman (Dr. W. H. Perkin), had been that so few English students of chemistry had devoted sufficient time to the prosecution of their studies. It was evident, therefore, in order to attain the necessary experience and certainty in carrying out original investigation in organic chemistry, that four to five years of close study and attention, under the leadership of a competent professor, were a necessity; and for carrying on successfully the manufacture of artificial colours it was indispensable that the chemist should be able to carry out independent original research because new colours had year after year to be discovered and manufactured, and the processes for their production had to be constantly improved in order to compete successfully with rival manufacturers. The success of an industrial enterprise depended not, indeed, upon the workman, not the foreman, as so many people in this country still believe, but upon the leading mind who directed the manufactory, who had a thorough grasp of scientific principles and had been trained to habits of scientific thought. He agreed that it was desirable to cultivate physical chemistry and inorganic chemistry much more than had been done, and he was very glad that the great supremacy which organic chemistry had enjoyed—more particularly in Germany, the home of chemistry—was now being contested by other and equally important branches of the science. But great, and very great, as had been the progress of organic chemistry, it had greater and more important problems still to solve; and in this country, which had given birth to so many of the most important steps in advance of that science, it had not received that amount of general attention which it had deserved in the past, and which it still deserved in the future. He therefore specially and heartily welcomed the opening of the first laboratory exclusively devoted to it in England. Prof. Schorlemmer, in his excellent and most suggestive little work "On the Rise and Development of Organic Chemistry," after giving a lucid review of the steps by which the great edifice of that science had been built up, gave in his concluding remarks a perspective of the problems still to be solved wide enough for the most expansive imagination of any searcher after truth. If to-day we still could not make morphine, quinine, and similar bodies artifically, the time was near at hand. If we could not make quinine, we had already found a partial substitute in antipyrine, and its introduction into therapeutics had lowered the price of quinine considerably. Another important problem was the synthesis of the ingredients of our daily food, such as sugar, gum, and starch. Those bodies were nearly related to each other, for we could convert the two latter into different kinds of sugar, and sugars again into gums. That the synthesis of sugar was imminent had already been stated. But it was quite different with those important parts of our food which had been called the albuminous bodies. Kekulé, in discussing the scientific aims and achievements of chemistry, brought forward the idea that if ever chemists should succeed in obtaining albuminoid bodies artificially it would be in the state of living protoplasm, perhaps in the form of those structureless beings which Haeckel called the "Monera." All attempts hitherto made for the purpose of producing living matter artificially had failed. The enigma of life could only be solved by the synthesis of an albuminous compound. Prof. Fischer, in a lecture delivered not long ago in Berlin, also expressed himself full of confidence that the time would arrive when we might attack successfully even the problem of the constitution and synthesis of the albuminoids, and might thus approach the problem of the origin of life. Surely with such a prospect before them as the ultimate result of the pursuit of organic chemistry, no amount of work, no amount of thought, no amount of time and trouble devoted to that study would be too much if it was well employed in leading successfully to the great end in view, although the goal might not be reached for generations to come.

The company afterwards adjourned to the new laboratory, which was declared open by Dr. Mond.

THE MIGRATIONS OF THE LEMMING.

UNDER the title "Myodes Lemmus, its Habits and Migrations in Norway," Prof. R. Collett, of Christiania, gives a valuable account of his researches into the habits and migrations of that interesting little rodent, the lemming, which has become so notorious on account of its periodic wanderings in vast hordes down the Scandinavian valleys. Prof. Collett finds the earliest notice of the lemming in an old Norse manuscript dating from the latter end of the thirteenth century, and reproduces a curious and striking woodcut from the great history of Olaus Magnus (1555), in which is graphically figured the descent of the lemmings from the clouds according to the prevalent belief. But the most valuable parts of the memoir are those which depend upon the author's personal knowledge of the lemming. The nature and habits of the lemming are clearly described, and much light is thrown upon the causes which from time to time lead such vast numbers of these animals to leave their native uplands and to begin their suicidal wanderings. The migrations seem to be directly due to over-population. In certain years, termed by the writer "prolific years," an abnormal fecundity is exhibited by the lemming; this phenomenon is not, however, confined to this species, but is shown also in numerous families of mammals, birds, and insects. The consequences of this great multiplication in the case of the lemming are thus described by Prof. Collett. "The enormous multitudes require increased space, and the individuals, which, under normal conditions, have each an excessively large tract at their disposal, cannot, on account of their disposition, bear the unaccustomed proximity of the numerous neighbours. Involuntarily the individuals are pressed out to the sides until the edge of the mountain is reached. In a short time they enjoy themselves there, and the old individuals willingly breed in the upper regions of the forests, where, at other times, they are entirely wanting. New swarms, however, follow on; they could not return, but the journey proceeds onwards down the sides of the mountains, and when they once reach the valleys, they meet with localities which are quite foreign to them. They then continue blindly on, endeavouring to find a home corresponding to

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that they have left, but which they never regain. The migratory individuals proceed hopelessly on to a certain death." Sooner or later all the wanderers meet their death—thousands are drowned in rivers or fjords, thousands are attacked by beasts and birds of prey, and thousands perish from the effects of cold and damp; but the greater number die from the effects of a peculiar epidemic which attacks them in the lowlands. It is pointed out by the writer that the wandering instinct developed during migratory years is probably of distinct service to the species in reducing the surplus population.

THE AUSTRALASIAN ASSOCIATION.

We gave, a fortnight ago, the presidential address delivered by the Hon. A. C. Gregory to the Australasian Association for the Advancement of Science at this year's meeting in Brisbane. Full reports of the proceedings in the different Sections have reached us, from the General Secretary, Mr. J. Shirley, but limits of space prevents us from printing more than a brief summary of them.

The public proceedings of the meeting were opened by a popular lecture on "Star Depths," by Mr. H. C. Russell. Mr. Russell traced the growth of knowledge concerning the distance of the stars, and the structure of the stellar universe, and illustrated his description by a selection from the excellent photographs of celestial scenery taken at Sydney Observatory.

We give a synopsis of the work of the various sections.

Astronomy, Mathematics, and Physics.

Mr. Alexander M'Aulay, as President of Section A, delivered an address "On Some Popular Misconceptions on the Nature of Mathematical Thought."

Mr. P. Baracchi, contributed a paper on "the most probable value and error of Australian longitudes, including that of the boundary lines of South Australia with Victoria and New South Wales." Dr. Ralph Copeland sent "Some Notes on the New Royal Observatory, Edinburgh," and Mr. H. C. Russell read a paper "On a Photographic Transit Instrument."

Chemistry.

Mr. J. H. Maiden delivered the presidential address in this Section, entitled, "The Chemistry of the Australian Indigenous Vegetation." Mr. E. A. Weinberg contributed a paper on the refractory gold ores of Queensland: their sources and treatment. Prof. A. Liversidge, F.R.S., read a paper on "Variations in amount of Ammonia in Water on keeping." He also described the internal structure of some Australian nuggets, of different sizes, which had been closely examined and photographed. The etching was conducted according to the following plan:—A clean section was made and highly polished, and acted upon by chlorine water or bromine water, tincture of iodine or potassium cyanide, or sodium chloride mixed with nitric acid. The crystals less readily soluble stand up in relief and resemble the well-known figures seen in metallic meteorites when etched. One curious fact observed was that when the nuggets were subjected to heat, bubbles or blebs were formed on the surface, which burst with a sharp report, probably due to water included in the nugget being converted into high-pressure steam. Several beautiful photographs showing the crystalline nature of the nuggets were exhibited. Other papers read were: "On the Corrosion of Aluminium," and "Contributions to the Bibliography of Gold," by Prof. Liversidge; "Pharmacy as a Science and its Future," by Dr. W. Finselbach; "Notes and Analyses of some of the Artesian Waters of New South Wales," by John C. H. Mingaye; "On the Economic Treatment of Gold Ores," by Geo. H. Irvine; "Queensland Native Astringent Medicines," by Dr. Joseph Lauterer; "Portland Cement after Fifty Years," by W. M. Doherty; "Some Remarks on the Teaching of Elementary Chemistry," by A. J. Sach; "Analysis of Eucalyptus Gums," by Dr. Wilton Love; "The Ointments of the British Pharmacopœia," by F. W. Simmonds; "Notes on the Poisonous Constituents of Stephania Hernandiiafolia," by Prof. Edward H. Rennie; "Preliminary Notes on the Bark of Carissa Ovata, *R. Br.* v. Stolonifera, *Bail*," by H. G. Smith; "On a Method of Shortening certain Chemical Calculations," by W. A. Hargreaves.

Geology and Mineralogy.

Prof. T. W. Edgeworth David, in his address to this Section, reviewed briefly some recent geological discoveries of special interest. A paper by Mr. E. F. Pittman, Assoc. R.S.M., entitled "Notes on the Cretaceous Rocks in the North-western Portion of New South Wales," gave the results of a recent geological journey by him over 1150 miles of country. The geological examination was made chiefly with the object of determining approximately the area and boundaries of the artesian water formation.

Among other papers read before this Section were:—"Anticlines and Synclines and their Relation to Mining," by Ernest Lidgey; "On the Nomenclature of Crystals," by Prof. A. Liversidge, F.R.S.; "The Development and Progress of Mining and Geology in Queensland," by William Fryar; "On the Present State of our Knowledge of the Older Tertiaries of Southern Australia," by G. B. Pritchard; "The Antiquity of Man in Victoria," by W. H. Ferguson; "The Glacial Deposits of Victoria," by G. Officer, L. Balfour, and E. G. Hogg; "Notes on Tin Mining at Herberton," by John Munday.

Biology.

Prof. A. Dendy took for the subject of his presidential address, "The Cryptozoic Fauna of Australasia." Mr. F. M. Bailey read a paper on peculiarities of the Phanerogamic Flora of Queensland. The paper chiefly contained descriptions of indigenous fruits recommended for cultivation. Mr. D. Le Souëf furnished a paper on the Tree Kangaroo (*Dendrolagus Bennettianus*), describing its mode of climbing, its food, and the way it is captured by the natives. In a paper on the eating of earth by the larger Macropodidæ, by J. Douglas Ogilby, evidence was given of the eating of earth by kangaroos in the Bourke district, New South Wales. This habit does not appear to have been previously recorded, though in the district under notice it plays no unimportant part in the economy of the larger marsupials.

Dr. M. C. Cook sent a paper entitled "Pestiferous Fungi and their Modes of Attack." Dr. Charles Chilton gave a general account of history, occurrence, distribution and habits of the blind Amphipoda and Isopoda found in the underground waters of the Canterbury Plains in New Zealand. Miss Lodder furnished a revised list of the Marine Mollusca of Tasmania. Some plants peculiar to the Burnett Basin were described by James Keys. In a paper entitled "Notes and Observations on the Genus Nephila," W. J. Rainbow dealt with—(1) the localities in which spiders of the genus Nephila abound; (2) the strength and elasticity of their webs, in the sticky meshes of which certain birds of weak wing-power are caught; (3) the question as to whether the Nephilæ eat birds thus captured; (4) the mode by which silk may be obtained from these spiders by artifical means, and the experiments made by certain naturalists with a view to ascertaining the amount that could be obtained from individuals of this genus in a season, the object of which was to endeavour to prove that the product might be used for economic purposes.

Dr. J. Müller, of Geneva, Switzerland, contributed a paper on the Pyrenocarpeæ of the Lichen family. Mr. A. J. Campbell described the nests and eggs of Australian Hawks. Mr. A. G. Hamilton, in a paper entitled "The Fertilisation of some Australian Plants," gave many of his own observations as to the mode by which fertilisation is effected. Mr. W. M. Maskell gave a synoptical list of the Coccidæ reported from Australasia and the Pacific Islands up to December 1894.

Mrs. W. Martin gave the life-history of the vegetable growth known as Native Bread (*Mylitta Australis*). Australian mosses were enumerated by Richard A. Bastow, and some notes on the poisonous constituents of *Stephania hernandiæfolia* were read by E. H. Rennie and E. F. Turner. Picrotoxine and an alkaloid possessing strongly poisonous properties and marked chemical characteristics have been isolated from an extract from the plant.

"Economic Entomology" was the title of a paper by the Rev. E. H. Thompson, who pointed out the great benefit resulting to a country from a properly conducted Government Entomological Department, and urged, in order to increase its usefulness: (1) the formation of a federal entomological department with a head staff and field observers in each of the colonies; (2) a federal agricultural and scientific journal for all the colonies, subsidised by all; (3) elementary entomology to be taught in the State schools, special reference being given to the insect pests peculiar to each district or colony; and (4) the

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